

LISTING OF CLAIMS

1. (previously presented) A plasma confining assembly for minimizing unwanted plasma formations in regions outside of a process region in a process chamber, comprising:

a first confining element positioned proximate the periphery of the process region, and including an exposed conductive surface that is electrically grounded; and

a second confining element positioned proximate the periphery of the process region, and including an exposed insulating surface, which is configured to at least partially cover a non-exposed conductive core that is electrically grounded, the second confining element being spaced apart from the first confining element such that one of the confining elements is disposed in an upper portion of the process chamber and the other confining element is disposed in a lower portion of the process chamber,

wherein the first confining element and the second confining element substantially reduces the effects of plasma forming components that pass therebetween.

2. (original) The plasma confining assembly as recited in claim 1 further including a third confining element formed from an insulating material and disposed between the first confining element and the second confining element, and proximate the periphery of the process region, the third confinement element being arranged to physically contain a plasma inside the process region and to substantially reduce the effects of plasma forming components that pass between the first confining element and the second confining element.

3. (original) The plasma confining assembly as recited in claim 2 wherein the third confining element is a ring that surrounds at least a portion of the process region, the third confining element being configured to permit by-product gas from the processing to pass through while substantially confining the plasma inside the process region.

4. (original) The plasma confining assembly as recited in claim 1 wherein the plasma forming components are charged particles or electric fields.

5. (original) The plasma confining assembly as recited in claim 4 wherein the first confining element and the second confining element are arranged to direct charged particles to the exposed conductive surface and sink charged particles therethrough to ground so as to reduce the density of charged particles in regions outside of the process region.

6. (original) The plasma confining assembly as recited in claim 4 wherein the first confining element and the second confining element are arranged to attract electric fields to the grounded conductive surface and the grounded conductive portion, respectively, so as to reduce the electrical field strength in regions outside of the process region.

7. (original) The plasma confining assembly as recited in claim 1 wherein the first confining element is disposed in an upper portion of the process chamber, and wherein the second confining element is disposed in a lower portion of the process chamber.

8. (presently amended) A plasma confining assembly for minimizing unwanted plasma formations in regions outside of a process region in a process chamber, comprising:

a first confining element positioned proximate the periphery of the process region, and including an exposed conductive surface that is electrically grounded; and

a second confining element positioned proximate the periphery of the process region, and including an exposed insulating surface, which is configured to ~~at least partially~~ cover a non-exposed conductive core that is electrically grounded, the second confining element being spaced apart from the first confining element such that one of the confining elements is disposed in an upper portion of the process chamber and the other confining element is disposed in a lower portion of the process chamber,

wherein the first confining element and the second confining element substantially reduces the effects of plasma forming components that pass therebetween,

wherein the first confining element is disposed in an upper portion of the process chamber, and the second confining element is disposed in a lower portion of the process chamber, and

wherein the first confining element is a ring that surrounds an upper electrode, and the second confining element is a ring that surrounds a bottom electrode, the upper and bottom electrode being arranged for producing an electric field that helps to ignite and sustain a plasma.

9. (original) The plasma confining assembly as recited in claim 1 wherein the first confining element is disposed in a lower portion of the process chamber, and wherein the second confining element is disposed in an upper portion of the process chamber.

10. (presently amended) A plasma confining assembly for minimizing unwanted plasma formations in regions outside of a process region in a process chamber, comprising:

a first confining element positioned proximate the periphery of the process region, and including an exposed conductive surface that is electrically grounded; and

a second confining element positioned proximate the periphery of the process region, and including an exposed insulating surface, which is configured to ~~at least partially~~ cover a non-exposed conductive core that is electrically grounded, the second confining element being spaced apart from the first confining element such that one of the confining elements is disposed in an upper portion of the process chamber and the other confining element is disposed in a lower portion of the process chamber,

wherein the first confining element and the second confining element substantially reduces the effects of plasma forming components that pass therebetween,

wherein the first confining element is disposed in a lower portion of the process chamber, and the second confining element is disposed in an upper portion of the process chamber, and

wherein the first confining element is a ring that surrounds a bottom electrode, and the second confining element is a ring that surrounds an upper electrode, the upper and bottom electrode being arranged for producing an electric field that helps to ignite and sustain a plasma.

11. (canceled)

12. (previously presented) The plasma confining assembly as recited in claim 1 wherein the non-exposed conductive core is formed from aluminum and wherein the exposed insulating surface is formed from anodized aluminum.

13. (original) The plasma confining assembly as recited in claim 1 wherein the conductive surface of the first confining element is formed from an electrically conducting material that is either substantially resistant to etching by a plasma present within the chamber during the processing or contributes substantially no metal contamination.

14. (canceled)

15. (previously presented) The plasma confining assembly as recited in claim 23 further including a pressure control ring formed from a dielectric medium and disposed between the first

and second rings, the pressure control ring being configured for physically confining a plasma within the process region, while permitting the passage of process gases to pass therethrough.

16. (previously presented) The plasma confining assembly as recited in claim 23 wherein the exposed insulating surface is configured to be level with a top surface of the second electrode.

17. (previously presented) The plasma confining assembly as recited in claim 23 wherein the first ring is configured to be disposed between the first electrode and a chamber wall of the process chamber, and wherein the second ring is configured to be disposed between the second electrode and the chamber wall of the process chamber.

18. (previously presented) The plasma confining assembly as recited in claim 23 wherein the first ring includes an inner ring and an outer ring, wherein the inner ring is formed from a dielectric medium and is configured to be disposed between the first electrode and the outer ring, and wherein the outer ring includes the conductive member of the first ring.

19. (previously presented) The plasma confining assembly as recited in claim 23 wherein the second ring includes an inner ring and an outer ring, wherein the inner ring is formed from a dielectric medium and is configured to be disposed between the second electrode and the outer ring, and wherein the outer ring includes the conductive portion and the insulating portion.

20. (previously presented) The plasma confining assembly as recited in claim 23 wherein the conductive element is a portion of the process chamber.

21. (previously presented) The plasma confining assembly as recited in claim 23 wherein the first ring and the second ring are configured to extend in a radial direction relative to an axis of the process chamber, and wherein an outer edge of the first ring extends further than an outer edge of the second ring.

22. (previously presented) The plasma confining assembly as recited in claim 17 wherein the first ring is spaced apart laterally from the chamber wall thus leaving an open area between the first ring and the chamber wall.

23. (previously presented) A plasma confining assembly for minimizing unwanted plasma formations in regions outside of a process region in a process chamber, comprising:

a first confining element positioned at a boundary between the process region where a plasma is ignited and sustained for processing a work piece and the regions outside of the process region where the plasma is not desired, the first confining element including a conductive member that is exposed within the process chamber, the conductive member being electrically grounded; and

a second confining element positioned at the boundary between the process region where the plasma is ignited and sustained for processing and the regions outside of the process region where the plasma is not desired, the second confining element including an insulating portion that is exposed within the process chamber, and a conductive portion that is covered by the insulating portion so as to keep the conductive portion from being exposed inside the process chamber, the conductive member being electrically grounded,

the second confining element being spaced apart from the first confining element so as to form an open area therebetween that permits by-product gases to pass therethrough from the process region to the regions outside of the process region while substantially preventing charged particles or electric fields from passing therethrough from the process region to the regions outside of the process region,

wherein the first confining element is formed as a first ring configured to surround a first electrode, and wherein the second confining element is formed as a second ring configured to surround a second electrode that is spaced apart and parallel to the first electrode, the first and second electrodes defining the process region therebetween, the first and second electrodes being configured for generating an electric field that is sufficiently strong to both ignite and sustain the plasma in the process region of the process chamber.

24. (previously presented) The plasma confining assembly as recited in claim 23 wherein the first and second confining elements are configured to be located between the process region and an exhaust port.

25. (canceled)

26. (previously presented) The plasma confining assembly as recited in claim 23 wherein the exposed conductive member of the first confining element and the exposed insulating portion of the second confining element each include surfaces that are substantially parallel to one another

and that are perpendicular to the boundary between the process region where a plasma is ignited and sustained for processing a work piece and the regions outside of the process region where the plasma is not desired.

27. (new) The plasma confining assembly as recited in claim 1 wherein the exposed conductive surface faces the exposed insulating surface such that the exposed insulating surface is disposed between the exposed conductive surface and the non exposed conductive core.

28. (new) The plasma confining assembly as recited in claim 1 wherein the insulating surface prevents electrons or negative ions from becoming trapped between the exposed conductive surface and the non exposed conductive core.

29. (new) The plasma confining assembly as recited in claim 1 wherein the exposed conductive surface that is grounded and the exposed insulating surface that covers a non-exposed conductive core that is electrically grounded cooperate to form a DC potential therebetween when an RF voltage is supplied to the process chamber, the DC potential guiding charged particles to the exposed conductive surface that is grounded, the exposed conductive surface that is grounded sinking the guided charged particles therethrough to ground so as to reduce the density of charged particles in regions outside of the process region.

30. (new) A plasma confining assembly for minimizing unwanted plasma formations in regions outside of a process region in a process chamber, comprising:

a first confining element including an exposed conductive surface that is electrically grounded, the exposed conductive surface that is electrically grounded being configured to sink charged particles therethrough to ground so as to reduce the density of charged particles in regions outside of the process region, the exposed conductive surface that is electrically grounded also being configured to attract electric fields so as to reduce the electrical field strength in regions outside of the process region; and

a second confining element including an exposed insulating surface, the exposed insulating surface covering a non-exposed conductive core that is electrically grounded, the insulating surface preventing charged particles from sinking into the non-exposed conductive core that is electrically grounded, the non-exposed conductive core that is electrically grounded being configured to attract electric fields so as to reduce the electrical field strength in regions outside of the process region.

31. (new) A plasma confining assembly for minimizing unwanted plasma formations in regions outside of a process region in a process chamber, comprising:

an upper ring surrounding an upper portion of the process region, the upper ring being configured to sink charged particles and RF electric fields therethrough; and

a lower ring surrounding a lower portion of the process region, the lower ring being configured to sink RF electric fields therethrough while preventing the passage of charged particles therethrough.